Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KIRT M. BABUDER, THOMAS M. BENDER,
DOUGLAS A. JOSEPH and L. JOSEPH STUPICA

Appeal No. 1998-0331
Application No. 08/297,257

ON BRIEF

Before McCANDLISH, Senior Administrative Patent Judge, and ABRAMS and GONZALES, Administrative Patent Judges.

GONZALES, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final rejection of claims 1, 2, 4 through 12 and 14, which are the only claims pending in this application.[1]

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[1] The claims were amended subsequent to the final (continued...)

We REVERSE and REMAND the application to the examiner for further consideration.

The appellants' disclosed invention pertains to a multiple spindle bar machine. A basic understanding of the invention can be derived from a reading of exemplary claims 1 and 5, a copy of which is set forth in the appendix to the appellants' brief.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Ledergerber et al. (Ledergerber)	3,686,986	Aug. 29, 1972
Burka	5,111,562	May 12, 1992
Derrien (DT '799)	2,611,799 (German patent disclosure)[2]	Oct. 7, 1976

"Handbook for Operators Acme-Gridley Multiple Spindle Bar Machines" (National Acme Division Acme-Cleveland Corp. 1980) (hereinafter "Acme")

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[1](...continued)
rejection. See Paper Nos. 11 and 14.

[2] In determining the teachings of this reference, we will rely on the translation provided by the Patent and Trademark Office. We are also assisted in our understanding of the reference by our review of the U.S. equivalent, U.S. Patent No. 4,084,482 to Derrien. Copies of the translation and U.S. Patent No. 4,084,482 are attached for the appellants' convenience.

Additional references discussed by this merits panel are:

Hermann 3,317,258 May 2, 1967[3]

A. Vallance and V. L. Doughtie, Design of Machine Members at 283, 284 (McGraw-Hill Book Co. 1943) (hereinafter "Vallance")[4]

[3] The Hermann patent was cited by the appellants in the information disclosure statement filed September 22, 1994. See Paper No. 5.

[4] A copy of the relevant pages is attached for the appellants' convenience.

The following rejections are before us for review.

Claims 1, 2, 4, 10 through 12 and 14 stand rejected under 35 U.S.C. § 103 as unpatentable over Acme in view of DT '799 and Burka.

Claims 5 through 9 stand rejected under 35 U.S.C. § 103 as unpatentable over Acme in view of DT '799 and Ledergerber.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejections, we make reference to the final rejection (Paper No. 9) and to the answer (Paper No. 17) for the examiner's complete reasoning in support of the rejections and to the brief (Paper
No. 16) for the appellants' arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. As a consequence of our review, we make the determinations which follow.

Claims 1, 2, 4, 10 through 12 and 14

We will not sustain the 35 U.S.C. § 103 rejection of claims 1, 2, 4, 10 through 12 and 14.

We begin by observing that in rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993); In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Only if that burden is met does the burden of coming forward with either evidence or argument shift to the applicant. Id. If the examiner fails to establish a prima facie case, the rejection is improper and will be overturned. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

Independent claim 1 is directed to a multiple spindle bar machine and requires, inter alia, first and second sets of tapered roller bearings rotatably supporting a spindle carrier, each of the sets of roller bearings including tapered

rollers[5] that have a roller axis of rotation which intersects an axis of rotation of the spindle carrier.

Independent claim 10 is directed to a bar stock machining apparatus including a spindle carrier mounted to a base for indexing portions of bars extending from an end of the carrier through multiple work positions adjacent one end of the spindle carrier, a plurality of spindles rotatably supported by the spindle carrier and two annular roller bearings for supporting the spindle carrier. The claim further requires that one of the annular roller bearings includes a plurality of tapered rollers wherein each tapered roller defines a line of action extending away perpendicularly from a surface of the tapered roller to intersect an axis of rotation of the spindle carrier at a point that is spaced from the end of the spindle carrier that faces the work positions.

The Acme reference discloses a conventional multiple spindle bar machine including a generally cylindrical spindle carrier supporting multiple spindles at angularly spaced

[5] We call attention to inaccuracies in the appellants' drawings, specifically, Figs. 6, 12 and 13 show cylindrical rollers 126, 254 and 290, rather than tapered rollers. See 37 CFR § 1.83(a).

locations about the spindle carrier. The spindle carrier is supported in a headstock (Fig. B-7) which includes first and second walls, the first of which faces a gearbox, having a throughbore for receiving the spindle carrier. As to the spindle carrier bearings, at section B, p. 14, the reference teaches that "[t]wo wide spindle carrier *journals* housed in the rugged *headstock* frame and a heavy bearing in the gearbox section rigidly supporting the stem end provide a three-point bearing for the carrier system." See, also, Fig. B-13.

The examiner describes Fig. 1 of the DT '799 reference as teaching a "first spindle bearing and a second spindle bearings [sic, bearing] each having a set of tapered roller bearings disposed in the headstock (12)" (see final rejection, p. 2 and answer, p. 5).

Burka discloses a machine tool including multiple rotary spindles for holding workpieces W. Each rotary spindle member 12 is mounted in a spindle carriage 34 that is rotatably mounted to a stationary support structure 30 by means of heavy duty
bearings 44 mounted in stepped portions of support structure 30. See Fig. 3 and col. 5, ll. 17-19. Additionally, the

machine tool is provided with a system for preloading the spindle carriage bearings 44 so as to insure that the workpieces W are more rigidly held in position during machining operations and insuring more accurate and reproducible machining. See col. 6, ll. 29-35. More particularly, Burka describes the preloading system as including a cam member 100, a roller actuator 104 and a valve 106. During indexing of the spindle carriage 34, the roller 104 rolls along the cam 100 with the valve 106 remaining in the normally closed position, blocking the feed port from a central manifold 24 and venting a hub space S to atmosphere. Just as the spindle carriage 34 approaches the end of the indexing cycle, the roller actuator 104 following the cam 100 is forced to actuate the valve 106. This closes the hub space S to atmosphere and opens it for communication with the central manifold 24. Accordingly, pressurized fluid fills the hub

space S, loading the bearings 44 prior to machining. Id. at ll. 36-56.

In rejecting claims 1 and 10 as being unpatentable over Acme in view of DT '799 and Burka, the examiner asserts that:

> It would have been obvious . . . to incorporate the Acme device with the first and second spindle carrier bearings each having a set of the DT '799 tapered roller bearings disposed in the headstock, as taught by DT '799, and the Burka spindle bearing loading means for applying a force on the first and second set of roller bearings to minimize lateral movement of the bearings disposed in the stepped portions of the upright inner surface, as taught by Burka, in order to reduce the shaft axial skidding and to allow more precise and reproducible machining of the workpiece.

Final rejection, p. 3.

The appellants do not challenge the examiner's determination that Fig. 1 of the DT '799 reference shows tapered roller bearings supporting the right-hand end of spindle 1. However, the appellants correctly point out that the specification of the DT '799 reference makes it clear that the bearings rotatably support the spindle 1 of a milling machine, not the spindle carriage of a multiple spindle bar

machine.[6] See brief, p. 7. Thus, the appellants assert that there is no teaching or suggestion in Acme, DT '799 or Burka of two roller bearings mounted in spaced apart stepped portions in a base and disposed between the base and a spindle carrier for supporting the spindle carrier wherein at least one of the roller bearings includes a plurality of tapered rollers. See brief, pp. 7 and 10.

Initially, we observe that the mere fact that the tapered roller bearings shown as supporting the spindle 1 in DT '799 could be substituted for one or both of the wide spindle carrier journals in the multiple spindle bar machine disclosed by the Acme reference would not have made the modification obvious unless the prior art suggested the desirability of doing so. See In re Mills, 916 F.2d 680, 682, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). Citing references which merely indicate that isolated elements and/or features recited in the claims are known is not a sufficient basis for concluding that the combination of claimed elements would have

[6] We note that Acme teaches tapered roller bearings supporting an individual spindle, not a spindle carrier, in a multiple spindle bar machine. See Figs. C-3 and C-4.

been obvious. That is to say, there should be some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art that would have led that individual to combine the relevant teachings. In re Fine, 837 F.2d at 1074, 5 USPQ2d at 1598.

Our review of the references confirms that none of the references teaches a tapered roller bearing supporting a spindle carrier in a multiple spindle bar machine. We also note that the examiner has failed to make any assertion as to the knowledge generally available to one of ordinary skill in the art that would have led that individual to substitute a tapered roller bearing for the conventional radial bearing taught by Burka and Acme for supporting a spindle carrier. As a result, we must agree with the appellants that the examiner's rejection fails to identify the necessary motivation for modifying Acme in the manner proposed in the rejection and is based on hindsight derived from the examiner's understanding of the appellant's own disclosure. The use of such hindsight knowledge to support an obviousness rejection under 35 U.S.C. § 103 is, of course, impermissible. See, for example, W. L. Gore and Assoc. v. Garlock, Inc., 721

F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

Accordingly, we will not sustain the standing 35 U.S.C. § 103 rejection of claims 1 and 10 or of claims 2, 4 and 14 dependent on claim 1 or of claims 11 and 12 dependent on claim 10.

Claims 5 through 9

We will also not sustain the 35 U.S.C. § 103 rejection of claims 5 through 9.

Independent claim 5 is directed to a multiple spindle bar machine comprising, inter alia, a rotatable cylindrical spindle carrier having a throughbore aligned with a longitudinal axis of the spindle carrier and a spindle drive shaft extending through the spindle carrier throughbore including a generally cylindrical hollow cavity co-axially extending through the length of the drive shaft, a fluid coupling at one end of the drive shaft for injecting pressurized fluid into the hollow cavity and a fluid coupling means at the opposite end of the drive shaft for routing fluid from the drive shaft hollow cavity to a spindle carrier interior manifold.

The examiner determined that Ledergerber teaches "a hydraulic control system (Fig. 3) to rout pressure fluid from the drive shaft hollow cavity to the spindle carrier (12) interior manifold (23)" (answer, p. 9). The appellants argue that Ledergerber contains no such teaching.

In Fig. 2, Ledergerber teaches a rotatable spindle carrier 12 supporting a plurality of spindles 11. Each spindle includes a front 13, 131 and rear 14, 141 "sliding type bearing" (col. 3, l. 6). Ledergerber also teaches a structure for preloading the rear bearing including a prestressed spring 15 which biases the outer race 14 against the inner race 141 and the inner race against the conical surface 112 of the spindle. See id. at ll. 21-25. In order to relieve or reduce the spring bias on the rear bearing, Ledergerber provides a hydraulic control system in Figs. 3-5, including a distributor

> mounted behind the carrier **12,** i.e., remote from the chucks of the spindles **11,** and comprises a cylinder **25** movable with reference to a distributor member of plunger **26.** The cylinder **26** [sic, **25**] is bolted to a centrally located holder **27** which is affixed to the indexing plate or wheel **28** for the spindle carrier **12.** Thus, the cylinder **25** is rigid with and is coaxially mounted on the

> carrier **12.** The plunger **26** is secured to a tubular support **29** which is angularly movable, within limits, with reference to the frame **F** of the machine tool but is held against axial movement. When the carrier **12** is indexed by the wheel **28,** the cylinder **25** turns with reference to the plunger **26.**

Col. 3, l. 63 through col. 4, l. 8. The examiner describes Ledergerber as disclosing "a hydraulic control system (Fig. 3) to rout pressure fluid from the drive shaft hollow cavity to the spindle carrier (12) interior manifold (23)," supra, but there is no "drive shaft hollow cavity" in Ledergerber's Fig. 3.

It is elementary that to support an obviousness rejection, all of the claim limitations must be taught or suggested by the prior art applied. See In re Royka, 490 F.2d 981, 984-85, 180 USPQ 580, 582-83 (CCPA 1974). The appellants argue that the applied prior art, taken individually or in combination, fails to teach or suggest a multiple spindle bar machine including a spindle drive shaft including a hollow cavity extending a length of the shaft, a fluid coupling at one end of the drive shaft opposite a drive gear for injecting pressurized fluid into the hollow cavity and a fluid coupling

means at the drive gear end of the shaft for routing fluid from the shaft hollow cavity to an interior manifold of the spindle carrier.

The examiner relies on Ledergerber for such a teaching. However, the examiner has failed to specifically identify where in the reference the teaching may be found and our review of Ledergerber fails to reveal any such teaching. Accordingly, we agree with the appellants' argument (brief, p. 15) that even if it were obvious to combine the teaching of Acme, DT '799 and Ledergerber in the manner proposed by the examiner in the rejection of claim 5, the person of ordinary skill in the art would not have obtained the structure set forth in claim 5.

Accordingly, we will not sustain the standing 35 U.S.C. § 103 rejection of claim 5 or of claims 6 through 9 dependent on claim 5.

REMAND

On remand to the examiner, the examiner should give due consideration to the following matters.

First, the examiner should review the teachings in Vallance, Hermann, the Acme reference and, possibly, other

prior art, for supporting an art rejection under 35 U.S.C. § 103. Vallance teaches that tapered roller bearings are "capable of carrying some thrust" and "prevent the imposed radial load from including excessive end thrust." See p. 284. Hermann teaches that it was known in the art to support machine tool spindles with tapered roller bearings, and that it was known that such bearings provide strong accurate radial support for the spindle and are capable of bearing the axial thrust imposed on the spindle. See col. 1, ll. 25-31. Acme teaches that it was known to support spindles with tapered roller bearing in the multiple spindle bar machine art. See footnote 6, supra.

The second matter requiring the examiner's attention relates to the recitation in claim 1 of "bearing loading means for applying a force on the first and second set of tapered roller bearings to minimize lateral movement of the bearings . . . and thus minimize movement of the spindle carrier and workpieces supported by the spindle carrier in a direction parallel to the axis of rotation of the spindle carrier" (emphasis added). The examiner should determine if the appellants' use of the word "lateral" to describe the movement

of the bearings which is to be minimized by the bearing loading means is indefinite, particularly, in view of the later language in the claim describing the resulting movement of the spindle carrier and workpieces that is minimized as movement "in the direction parallel to the axis of rotation of the spindle carrier," i.e., axial movement. The meaning of the word "lateral" in the context of the claim is further obscured by the description of the prior art in the appellants' specification wherein the conventional gearbox housing bearing is described as providing "both thrust and axial support to the carrier stem, that is, the bearing prevented both lateral and axial movement of the carrier stem" (p. 3). The meaning of "lateral movement" in both claims 1 and 4 requires clarification and may warrant a 35 U.S.C. § 112, second paragraph, rejection in the absence of a satisfactory explanation.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1, 2, 4 through 12 and 14 under U.S.C. § 103 is reversed.

Additionally, we have remanded the application to the examiner for consideration of additional issues.

This application, by virtue of its "special" status, requires immediate action by the examiner. See the Manual of Patent Examining Procedure, § 708.01(D) (7th ed., Rev. 1, Feb. 2000).

REVERSED AND REMANDED

HARRISON E. McCANDLISH Senior Administrative Patent Judge	)	
NEAL E. ABRAMS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JOHN F. GONZALES Administrative Patent Judge	)	

JFG:clm

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APPENDIX

1. A multiple spindle bar machine comprising:

a) a generally cylindrical spindle carrier that supports multiple spindles at angularly separated locations about a circumference of the spindle carrier for rotating multiple elongated workpieces which extend from the spindle carrier to angularly separated workstations at one end of the spindle carrier;

b) first and second spaced apart uprights each having an inner surface defining a throughbore dimensioned to receive the generally cylindrical spindle carrier wherein each upright has a stepped portion that extends circumferentially around each of the inner surfaces adjacent an outside face of each upright;

c) first and second sets of tapered roller bearings disposed in the stepped portions of the first and second uprights respectively wherein each set of tapered roller bearings circumferentially extends around an outer surface of the spindle carrier to rotatably support the spindle carrier within the spaced apart uprights, each of the first and second sets of roller bearings including tapered rollers that rotate

upon indexed movement of the spindle carrier and have a roller axis of rotation which intersects an axis of rotation of the spindle carrier;

d) bearing loading means for applying a force on the first and second set of tapered roller bearings to minimize lateral movement of the bearings disposed in the stepped portions of the upright inner surfaces and thus minimize movement of the spindle carrier and workpieces supported by the spindle carrier in a direction parallel to the axis of rotation of the spindle carrier and secure the workpieces relative to the angularly separated workstations; and

e) bearing sealing means for sealing the first and second sets of roller bearings from external contaminants.

5. A multiple spindle bar machine comprising:

a) a base having a headstock coupled thereto;

b) a drive system for simultaneously rotating multiple bars and having a drive gear coupled to a spindle drive shaft;

c) a plurality of spaced apart rotatable bar holding spindles, each spindle having a coaxial spindle gear connected to the drive gear and being journaled in a spindle bearing, the spindle bearing including tapered roller bearings; and

d) a rotatable cylindrical spindle carrier mounted in an opening in the headstock supporting the plurality of spindles within a plurality of spindle bearings and including a throughbore aligned with a longitudinal axis of the spindle

carrier and an interior manifold for routing pressurized fluid to preload the plurality of spindle bearings that support the bar holding spindles;

e) said spindle drive shaft extending through the spindle carrier throughbore and having the drive gear attached to an end of the drive shaft to intermesh with each of the spindle gears and thereby rotate the spindles, the drive shaft including a generally cylindrical hollow cavity co-axially extending through the length of the drive shaft, a fluid coupling at an end of the spindle drive shaft removed from the drive gear for injecting pressurized fluid into the hollow cavity and a fluid coupling means at the drive gear end of the drive shaft for routing fluid from the drive shaft hollow cavity to the spindle carrier interior manifold.